device and system, an optical memory device and system, fixed memory, and removable memory. For example, memory **14** can be comprised of any combination of random access memory (RAM), read only memory (ROM), static storage such as a magnetic or optical disk, or any other type of non-transitory machine or computer readable media. The instructions stored in memory **14** may include program instructions or computer program code that, when executed by processor **22**, enable the apparatus **10** to perform tasks as described herein.

[0045] Apparatus **10** may also include or be coupled to one or more antennas **25** for transmitting and receiving signals and/or data to and from apparatus **10**. Apparatus **10** may further include or be coupled to a transceiver **28** configured to transmit and receive information. For instance, transceiver **28** may be configured to modulate information on to a carrier waveform for transmission by the antenna(s) **25** and demodulate information received via the antenna(s) **25** for further processing by other elements of apparatus **10**. In other embodiments, transceiver **28** may be capable of transmitting and receiving signals or data directly.

[0046] Processor **22** may perform functions associated with the operation of apparatus **10** which may include, for example, precoding of antenna gain/phase parameters, encoding and decoding of individual bits forming a communication message, formatting of information, and overall control of the apparatus **10**, including processes related to management of communication resources.

[0047] In an embodiment, memory **14** may store software modules that provide functionality when executed by processor **22**. The modules may include, for example, an operating system that provides operating system functionality for apparatus **10**. The memory may also store one or more functional modules, such as an application or program, to provide additional functionality for apparatus **10**. The components of apparatus **10** may be implemented in hardware, or as any suitable combination of hardware and software.

[0048] In one embodiment, apparatus **10** may be a slave node in a packet switched network. In this embodiment, apparatus **10** may be controlled by memory **14** and processor **22** to create a peer list comprising an identifier of at least one peer slave node that shares a same master node as the apparatus **10** or that has a certain predefined affinity with the apparatus **10**. Apparatus **10** may then be controlled by memory **14** and processor **22** to announce the holdover time of the apparatus **10** to the at least one peer slave node. When a predefined event occurs, apparatus **10** may be further controlled by memory **14** and processor **22** to announce to the at least one peer slave node that the apparatus **10** is taking on a mini-master role for at least the announced holdover time.

[0049] In an embodiment, the predefined event includes determining that the apparatus has lost communication with its master node or when the delay and jitter in the communication path with the master node has degraded below a certain threshold.

[0050] According to one embodiment, apparatus **10** may be controlled by memory **14** and processor **22** to receive synchronization messages from one or more subordinate slave nodes that decide to synchronize with the apparatus **10** that is taking on the mini-master role. However, when the apparatus **10** receives an announcement from another slave node indicating that it is taking on a mini-master role with a better holdover time, the apparatus **10** may be controlled by memory **14** and processor **22** to immediately stop the sending of its own mini-master announcements.

[0051] In an embodiment, apparatus **10** may be controlled by memory **14** and processor **22** to relinquish the mini-master role when the predefined event ends (i.e., when apparatus **10** has restored its communication with the master node and/or it has determined that delay and jitter between itself and the master node has receded to a certain threshold), and to notify the subordinate slave node(s) to try to re-establish communication with the master node or to synchronize with another mini-master node. In one embodiment, when the pre-defined event ends, apparatus **10** may be controlled by memory **14** and processor **22** to decide to become a boundary clock to continuously serve the subordinate slave node(s).

[0052] FIG. **3** illustrates a flow diagram of a method according to one embodiment of the invention. In an embodiment, the method depicted in FIG. **3** may be performed, for example, by a slave node in a packet switched network. In this example, the method may include, at **300**, creating a peer list comprising an identifier of at least one peer slave node that shares a same master node as the slave node or that has a certain predefined affinity with the slave node. The method may also include, at **310**, announcing a holdover time of the slave node to the at least one peer slave node. At **320**, the method may include, when a predefined event occurs, announcing to the at least one peer slave node that the slave node is taking on a mini-master role for at least the announced holdover time. In one embodiment, the predefined event includes determining that the slave node has lost communication with its master node or when the delay and jitter in the communication path with the master node has degraded below a certain threshold.

[0053] In one embodiment, the method of FIG. **3** may further include, at **330**, receiving synchronization message(s) from one or more subordinate slave node(s) that decide to synchronize with the slave node taking on the mini-master role. According to one embodiment, the method may include, when the slave node receives an announcement from another slave node indicating that said another slave node is taking on a mini-master role with a better holdover time, immediately stopping, by the slave node, the sending of its own mini-master announcements.

[0054] According to an embodiment, the method may also include, at **340**, relinquishing the mini-master role when the predefined event ends, and notifying the at least one subordinate slave node to try to re-establish communication with the master node or to synchronize with another mini-master node. In other embodiments, when the pre-defined event ends, the method may include the slave node deciding to become a boundary clock to continuously serve the at least one subordinate slave node.

[0055] In some embodiments, the functionality of any of the methods described herein, such as those illustrated in FIG. **3** discussed above, may be implemented by software and/or computer program code stored in memory or other computer readable or tangible media, and executed by a processor. In other embodiments, the functionality may be performed by hardware, for example through the use of an application specific integrated circuit (ASIC), a programmable gate array (PGA), a field programmable gate array (FPGA), or any other combination of hardware and software.

[0056] As a result of certain embodiments of the invention, a majority of slave nodes can take on very low cost oscillators to further reduce the CapEx of the base station and rely on a